REMARKS

Claims 1, 2, 4-9, and 11-17 will be pending upon entry of the present response. No claims are amended and no new matter has been added to the specification herewith.

Applicants thank Examiners Hamo and Kramer for their consideration in conducting a telephone interview with the undersigned representative on November 6, 2008. Applicants understand that Examiner Hamo found the argument presented to be persuasive, and that he agreed that claim 1 was allowable over the art of record.

The Examiner asked the undersigned to provide a summary of the arguments presented and to locate and cite by Information Disclosure Statement some representative references that disclose the prior art solutions discussed during the interview. Accordingly, an Information Disclosure Statement is submitted herewith disclosing a number of references located in response to the Examiner's request. A couple of these references will be discussed briefly below, following the interview summary. Applicants understand that the Examiner will update his search prior to issuing a Notice of Allowance.

Claim 1 recites, in part, a "valve plate for a hydraulic machine, comprising ... a first pressure relief port located in the valve plate substantially outside of the annular region at a top-dead-center position; and a second pressure relief port located in the valve plate substantially outside of the annular region at a bottom-dead-center position, the second pressure relief port being in fluid communication with the first pressure relief port." Claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Valentin (U.S. Patent 6,406,271) in view of Umeda et al. (U.S. Patent 6,186,748, hereafter *Umeda*). Valentin provides compensation ports 75, 76 at top- and bottom-dead-center positions, respectively, which are in fluid communication with each other. However, the ports lie within the annular region defined by its main ports. For its part, Umeda provides bypass ports M1, M2 that are positioned partially outside the annular region and are in fluid communication with, respectively, its suction port S and discharge port T. The rejection of claim 1 relies on a substitution of Umeda's bypass ports for Valentin's compensation ports.

Applicants' argument for the allowability of claim 1 rested on several elements. First, a combination of Valentin and Umeda would require a change in function of Umeda's

bypass ports in order to comply with the limitations of claim 1. Umeda's bypass ports M1, M2 are not in fluid communication with each other as required by the language of the claim. Instead, the ports M1, M2 are in fluid communication with, respectively, its suction port S and discharge port T. These ports are part of a system that allows fluid to continue to flow from the suction port S to the cylinder ports C1-C9 even as it begins to flow from the cylinder ports to the discharge port T, in order to smooth out the pressure changes in the cylinders of the cylinder block 2, resulting in a smooth sinusoidal-type pressure curve as shown in Umeda's Figure 5. As is clear from Umeda's disclosure, in particular as described in columns 6-8, the shapes, positions, and couplings of all of the elements, including the bypass ports M1, M2, are carefully selected to effect the smooth pressure transition it described. In order to replace Valentin's compensation ports, and conform to the language of claim 1, Umeda's ports M1, M2 cannot be in fluid communication with the suction and discharge ports, but must instead be in communication with each other, which changes their function and principles of operation.

Second, Valentin teaches away from the teachings of Umeda. In its background discussion, Valentin states the following.

> Prior art designs have basically attempted to delay the pressure change by providing grooves in circumferential direction as extension of the ports. These grooves are noticeably effective only at certain points of operation .... In addition, the grooves increase the internal leakage and therefore reduce the efficiency.
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> It is therefore desirable to increase the efficiency ... and to reduce the noise, size, weight and cost of an axial-piston pump by overcoming these and other problems in the prior art.

(Column 4, lines 22-29 and 37-41.)

Valentin also points to its own design as improving efficiency and reducing noise (see Column 6, lines 15-26). The undersigned representative noted that Valentin's description of the prior art quoted above reads very clearly on Umeda's structure, as shown in Figures 4A-4C, and that a combination of Umeda, according to its established function, with Valentin would defeat the benefits of Valentin's device. Thus, Valentin clearly teaches away from such a combination.

Third, one of ordinary skill in the art would not find any motivation to modify Valentin according to the teachings of Umeda in a way that would conform to the limitations of claim 1, because of Valentin's teaching away, as discussed above, and because the principles by which each reference approaches the same problem – reducing noise and vibration – are entirely distinct from each other. Umeda provides gradual and overlapping transitions of each piston cylinder as it moves from the suction port to the discharge port, intentionally permitting some cross leakage of fluid to smooth the transition, and also provides an odd number of cylinders so that each cylinder transitions separately from the others. For its part, Valentin provides an even number of cylinders so that as one is transitioning from high to low pressure, the cylinder opposite is simultaneously transitioning from low to high pressure, and Valentin places these opposing cylinders in fluid communication with each other to equalize the pressure at a point in the rotation where they are each completely isolated from the high- and low-pressure fluid supplies. Absent the present application as a template, there is nothing in either reference to suggest that some element of Umeda's less efficient, very different structure might be adapted for use by Valentin to improve its power output, and there would have been no reasonable expectation of success.

Finally, it was argued by the undersigned that the proposed change in the shape of Valentin's ports that would be necessary to meet the limitations of the claim was not merely "one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of [performing an identical function]." (See *In re Dailey*, 357 F.2d 669, 673 149 U.S.P.Q. 47(1966).) Instead, such a change in shape, size, and position would significantly alter the functionality of Valentin's ports. Because Valentin's compensating ports 75, 76 are positioned within the annular region defined by its main ports 73, 74, the main ports must be shortened by the width of one of its cylinder ports so that each cylinder port can break fluid contact with a main port before entering fluid contact with a compensation port. Accordingly, each cylinder port breaks fluid contact with a main port about 21° short of dead center and doesn't make fluid contact with the opposite main port until about 21° after crossing dead center. Otherwise, a fluid short circuit would occur between the main ports via opposed cylinder ports and the compensating ports, which would result in significant fluid leakage and loss of

efficiency. Accordingly, each cylinder port travels about 42° at both top- and bottom-dead-center during which no energy transfer occurs, resulting in a reduction of available power output. Valentin acknowledges this reduction in power as an acceptable trade-off for the improved efficiency that is obtained by its design (column 13, lines 7-11).

Because the pressure relief ports of claim 1 are positioned outside the annular region defined by its first and second ports, the cylinder ports of a hydraulic machine that incorporates the claimed valve plate travel only about two or three degrees at the dead-center positions between breaking contact with one of the ports and making contact with the opposite port. Thus, the claimed invention obtains the same improved efficiency as Valentin, but also recovers the power capability that Valentin's design surrrenders.

As noted above, the Examiner was persuaded by these arguments and agreed that claim 1 was allowable over the art of record.

In order to provide the references that the Examiner requested, the undersigned conducted a brief search of the U.S. Patent and Trademark Office online database and located the references cited in the attached Information Disclosure Statement. Applicants wish to call the Examiner's attention to two of the references cited: U.S. Patent No. 4,075,933 issued to Stephens, and U.S. Patent No. 5,105,723 issued to Kazahaya et al.

Referring first to Figure 5 of the Stephens reference, a valve plate 19 is shown, including valve ports 85, 86 that together define an annular region of the valve plate. Additionally, at the top- and bottom-dead-center positions, there are two openings 84 positioned outside the annular region. However, these openings are not analogous to the pressure relief ports of claim 1. Instead, the openings are provided to receive tubular spring pins 82 that prevent the valve plate 19 from rotating relative to the port block 13 (see column 5, lines 33-38). Referring to Figure 2, which shows a cross section of the machine, it can be seen that the spring pins 82 extend partway into the openings 84 from the passageways 83 in the port block 13. The passageways 83 "provide drainage to and from the cavity in valve block 13 in which bearing 16 is mounted and also to insure lubrication of the bearing." (Column 5, lines 36-38). In Figure 2 it can be seen that the openings 84 are sealed at the top surface of the valve plate 19 by the face 74 of the cylinder carrier 24, so the above referenced drainage cannot occur via the openings. In

fact, there appears to be no fluid passage via the openings 84. Fluid passage is instead permitted via the spring pins 82 – spring pins typically include a lengthwise split – near the opposite side of the valve plate, where a gap between the valve plate and the port block 13 is provided, and through which fluid within the motor housing 10A can pass into and out of the passageways 83 to lubricate the bearing 16.

Furthermore, a second of the openings 84 is not in fluid communication with a first of the openings, as recited in claim 1, but instead, the openings are both in fluid communication generally with the interior of the motor housing via the gap between the back side of the valve plate and the face of the port block. Clearly, the openings do not function as pressure relief ports and are not analogous to the pressure relief ports of the valve plate of claim 1.

Turning now to the Kazahaya reference, Figures 3, 4 - A, and 4 - B show a valve plate 7 that includes intake and discharge ports 70, 71 that define an annular region, and axial holes 75 that are positioned at top- and bottom-dead–center, outside the annular region. Again, however, the axial holes are not configured to function as pressure relief ports. Instead, the holes 75 open into ring-like low pressure grooves 74a and 74b located on opposite faces of the valve plate, and serve to collect oil that oozes from between the cylinder block 4 and the valve plate 7 (see column 5, lines 9-20 and column 6, lines 52-55). The oil collected by the grooves is supplied via guide holes 21 (see Figure 1) to the thrust bearing 31 for lubrication (column 6, line 56-58). As with the Stephens reference, the holes 75 do not provide any pressure relief function. Instead, they merely permit fluid at low pressure to pass from one side of the valve plate to the other. Accordingly, the holes are not analogous to the pressure relief ports of the valve plate of claim 1.

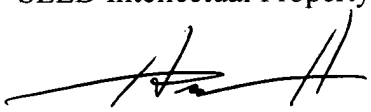
Applicants thank the Examiner for indicating the allowability of claims 4-17. In view of the Examiner's interview and the comments provided above, Applicants respectfully submit that claims 1 and 2 are also allowable, and therefore request that the Examiner reconsider this application and timely allow all pending claims. Examiner Hamo is encouraged to contact Mr. Bennett by telephone at (206) 694-4848 to discuss the above and any other distinctions

between the claims and the applied references, and to address any informalities that may remain unresolved.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

SEED Intellectual Property Law Group PLLC



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